THE CHINESE MEDICINE "SHU"
4. Some Nomenclatural and Taxonomic Notes on the *Atractylodes* D.C.

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This is the last in a four-part series of papers on the Chinese medicine"shu", and it deals with taxonomy and nomenclature of the "shu" source plants.

Atractylodes DC. is not a well known group of plants in the West. Conversely, in the Far East this genus is well known and economically very important because its members yield an herbal medicine extremely popular in Korea, Japan and China. In China the four species of *Atractylodes* used in traditional Chinese medicine are known under the generic name of "shu."

The genus *Atractylodes* was established by De Candolle in 1838. It belongs to the family *Compositae*, subfamily *Asteroidae* and the tribe *Cynarae* (*Cardueae*) [1].

Although the genus is small (not more than ten species), its intrageneric taxonomy is very confused and needs a through revisionary study. However, for various reasons this author is not in a position to carry out such a study. Consequently, he compiled this paper to fill the gap provisionally until a more comprehensive account of the taxonomy of this genus can be produced. Thus, herein will be presented seven remarks identifying the most important deficiencies and areas requiring improvement in the taxonomy of the genus.

1) The first two members of the genus *Atractylodes* were described by C.P. Thunberg. He found the plants cultivated in Japan (1775-1776) during his stay in that country. Thunberg referred the plants to the genus *Atractylis* L. and described two species: *Atractylis lancea* and *A. ovata* [9].

Later, botanists found that the natural distribution of the genus *Atractylis* L. is within the limits of the Mediterranean Region. Consequently, De Candolle established in 1838 a new genus *Atractylodes* and transferred all East Asian species of *Atractylis* into this new genus.

Certain specialists on East Asian flora do not recognize the genus *Atractylodes* as a separate genus, allegedly because it has no significant differences from *Atractylis* in the

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structure of generative parts. A comparative study by this author showed that besides the marked differences from Atractylis in the structure of vegetative parts, the genus Atractylodes differs from the genus Atractylis L. as follows: (a) The heads of Atractylis are homogamous (florets all perfect), while in Atractylodes DC. the heads are heterogamous (florets are either all perfect or all pistillate with aborted stamens)[2,5]; (b) in Atractylis L. the receptacle is chaffy; chaffs are oblong-ovate or linear, dissected into two lobes, of which one is short ovate, acute; another one is very long, awn-like, very narrow; in addition, the chaffs are ciliate and slightly erose at the margin; (Fig. 1 d,e,f) in Atractylodes DC. the receptacle is bristly; bristles are simple, linear, narrow, entire, not ciliate at the margin. (Fig. 1 c); (c) Anothers' appendages in Atractylis L. are very narrow, linear, drawn out into a very long, sharp apex, very densely, minutely, flexuously hairy (Fig. 1. g); in Atractylodes DC. the appendages are oblong or narrowly ovate, sometimes lobate, obtuse or acutish at the apex; on the surface they are rather loosely beset with minute, straight hairs (Fig. 1 a,b).

Thus, in this author's opinion the characteristics described above are sufficient to recognize the genera Atractylis L. (1737) and Atractylodes DC. (1838) as two separate genera.

2) In the Flora USSR[1] it is said that the type species of the genus Atractylodes DC. is A. lancea (Thunb.) DC. However, in the ING[3] it is said about the type species of Atractylodes DC.: "Typus non designatus." The explanation for this contradiction is found in Professor Bobrov's personal letter to this author [1a], in which he says that he selected A. lancea (Thunb.) DC. as the type of the genus, for purely formal reasons, i.e. because this species is cited first in the protologue of the genus. No typification whatsoever of the genus Atractylodes DC. has ever been made and this genus, so far, has no officially designated nomenclatural type.

3) In the latest handbook of the Soviet Far Eastern Flora [10] the authority of the genus Atractylodes is cited in an erroneous way. It reads: Atractylodes L., while it should read Atractylodes DC.

4) The diagnoses of the two first species of Atractylodes, Atractylodes ovata (Thunb.) DC. and A. lancea (Thunb.) D.C. are extremely short (each consists of only nine words)[9]. Naturally, such short descriptions are unable to give any clear idea of the species. Although these species are still treated as two distinct species, although with a rather

doubtful taxonomic status, Bobrov[1a] suggests that it might have happened that Thunberg described not two separate species, but two cultivated varieties of one species. This certainly should be verified. In addition, the fact that Thunberg described these taxa from cultivated plants, disproves the old notion that the type locality of the genus Atractylodes DC. is in Japan. This in turn poses a question: In what part of continental Eastern Asia then is the original native area of distribution of A. ovata?

5) Atractylodes separata Bailey listed by Hu[4] as occurring in China (prov. Hupei, Szechuan) is conspecific, according to Koidzumi[6] with A. lancea (Thunb.) DC.

6) A. japonica Koidz. ex Kitam. This species of Atractylodes ought to be critically revised because it apparently has been published with serious violations of the rules of ICBN: (a) no formal description of this species at the time of its publication was provided; consequently, A. japonica is nomen nudum; (b) the nomenclatural type of this taxon has never been designated; (c) there are serious doubts with regard to the relationship of A. japonica and A. ovata; it seems that diagnostic characteristics of both species overlap, at least in part. Thus, it appears to be advisable for the Japanese botanists to re-study, re-describe or re-validate the publication of A. japonica Koidz. ex Kitam in the future.

7) A. pinnatifolia (Kom.) S.Y. Hu. A new species of Atractylodes proposed by Hu[4]. Taxonomic status of this species seems to be questionable because it is described on the basis of only one herbarium specimen. Furthermore, separation of this taxon is based, for the most part, on the plant's leaf shape. However, there is a general rule that in the genus Atractylodes DC., leaf shape cannot be used as a diagnostic characteristics because it is extremely changeable [1,7,8].

It is hoped that this sharing of information about the problem with regard to the taxonomy of the genus Atractylodes will serve as a springboard for the beginning of a revisionary study of this genus.

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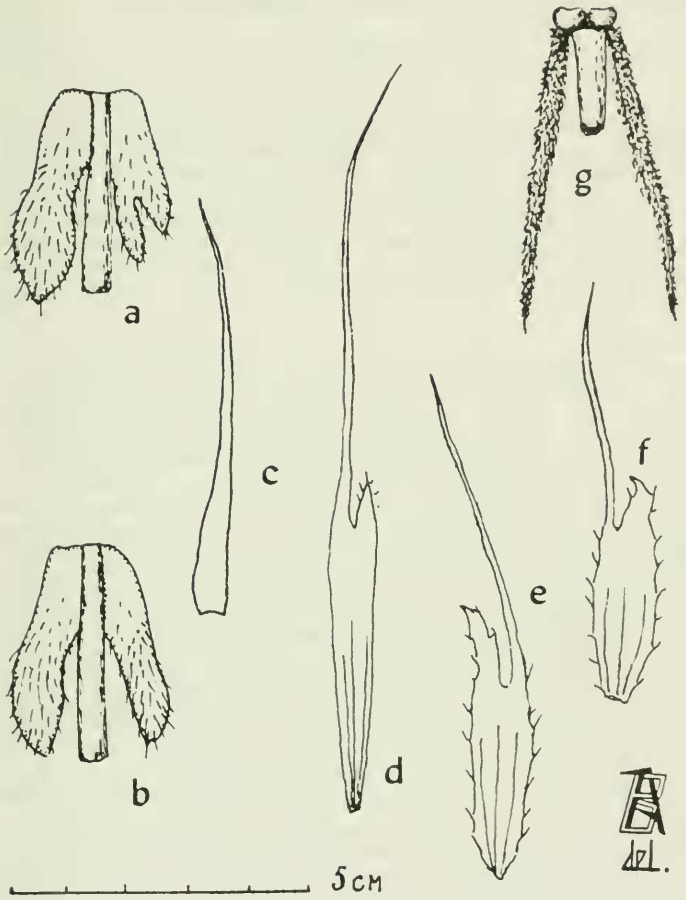

Fig. 1

Receptacle scales and anther appendages in Atractylis L. and Atractylodes DC.

Atractylodes DC.: a and b - anther appendages; c - receptacle bristle. a and b X ca. 20; c X ca. 5.

Atractylodes ovata (Thunb) DC.: Kirin, Manchuria, Wasteland. Coll. F. H. Chen. No. 141. 24-VII-1931[GH].

Atractylis L.: d,e,f - receptacle chaffs; g - anther appendages. d,e,f and g X ca. 15.

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